

FIG. 1

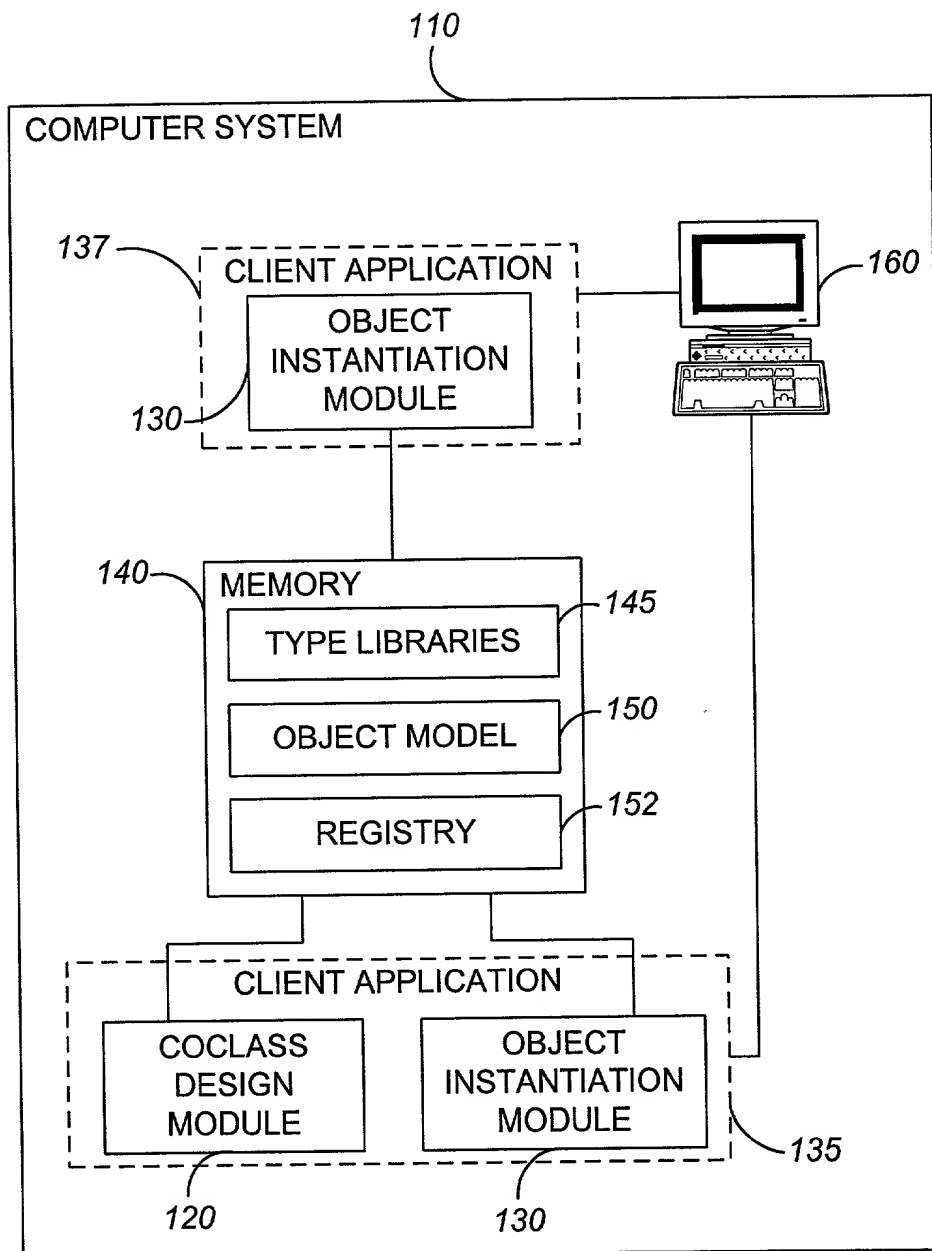


FIG. 1

100

DESIGN-TIME ENVIRONMENT  
200

RUNTIME ENVIRONMENT  
250

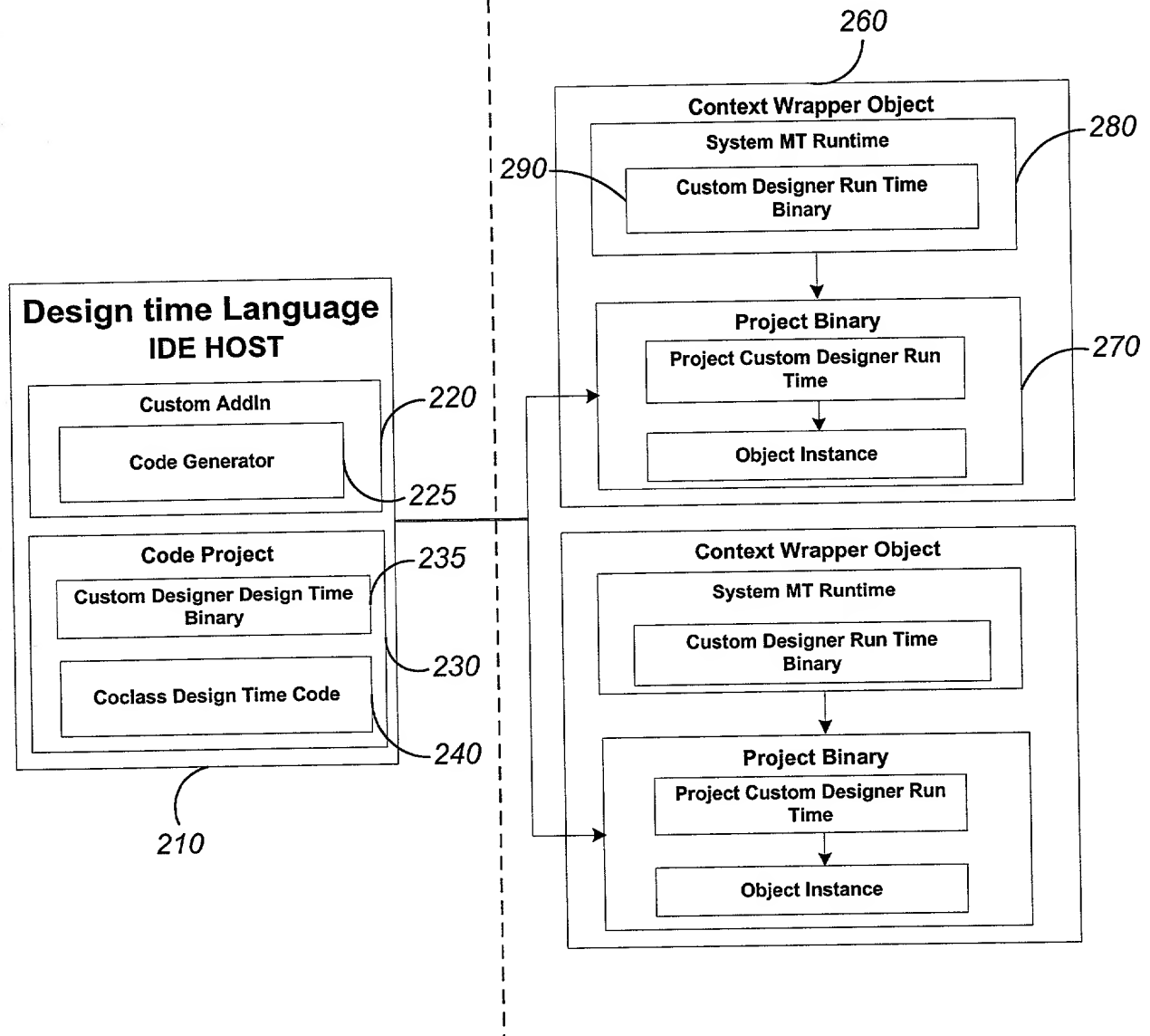
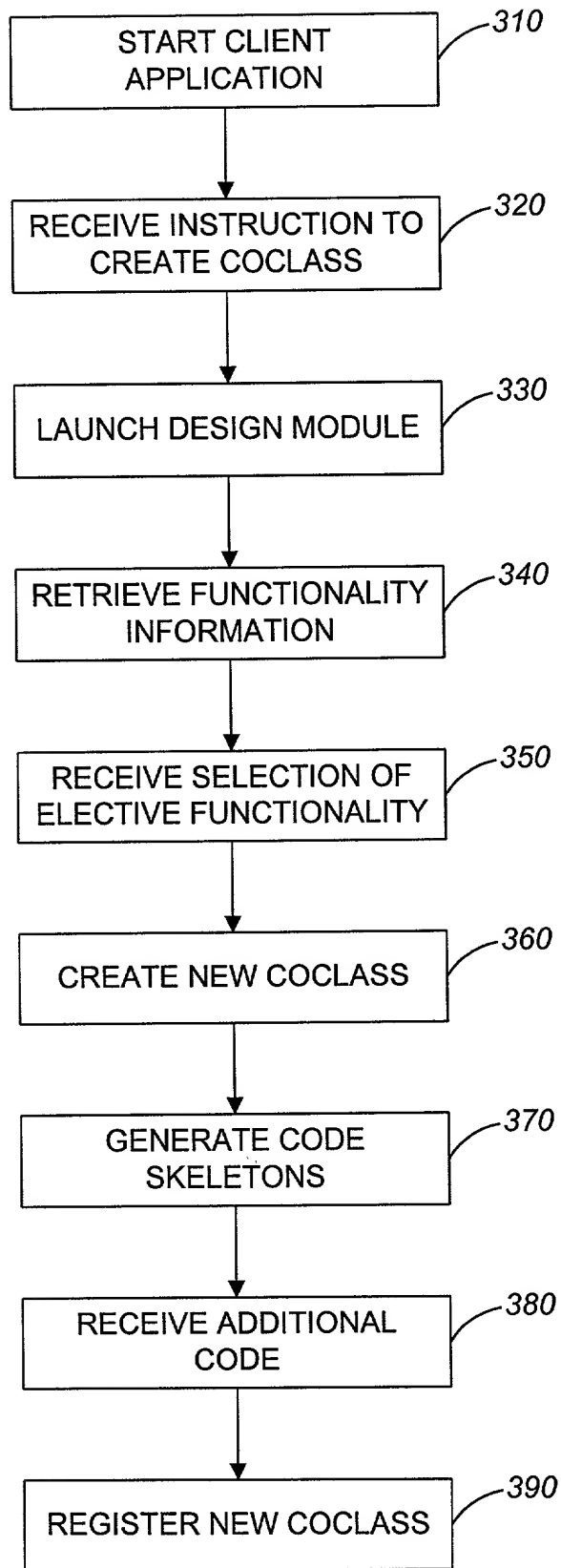


FIG. 2



300

FIG. 3

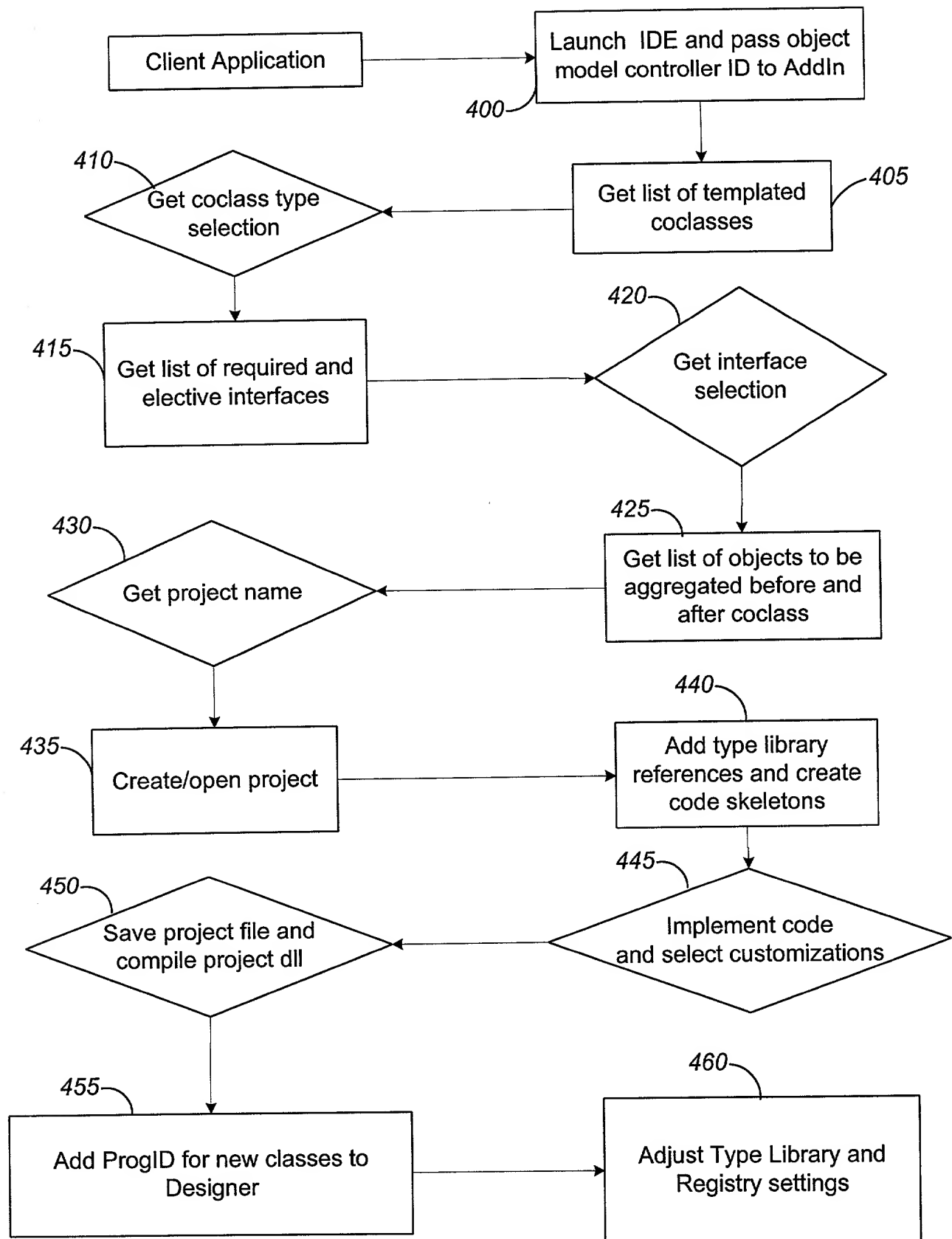
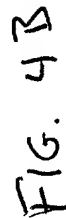


FIG. 4A

## VBA Project Instantiation-1



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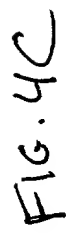


FIG. 4C

**P**

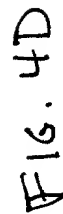
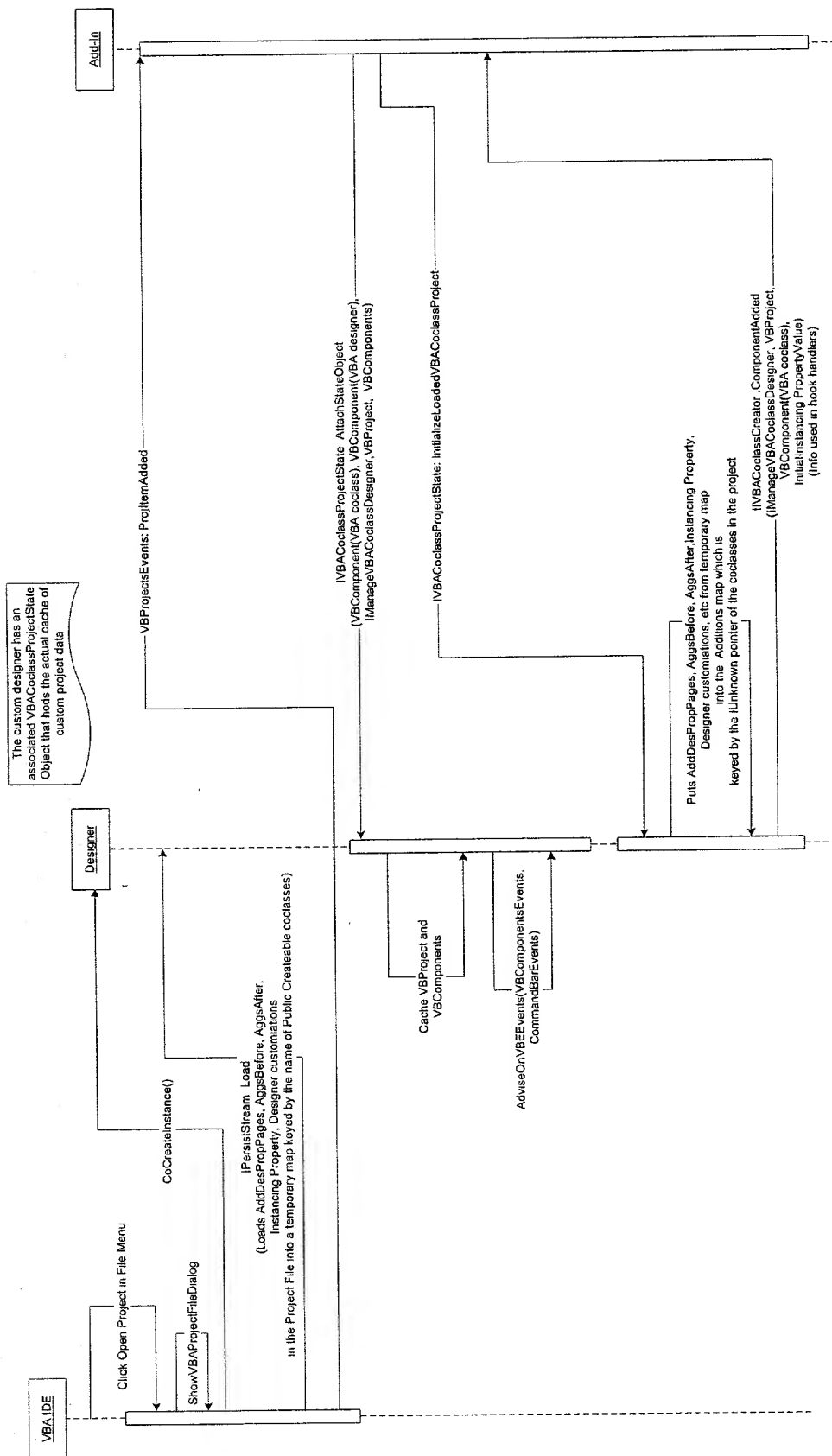


Fig. 4D

# VBA Project Open, Removal

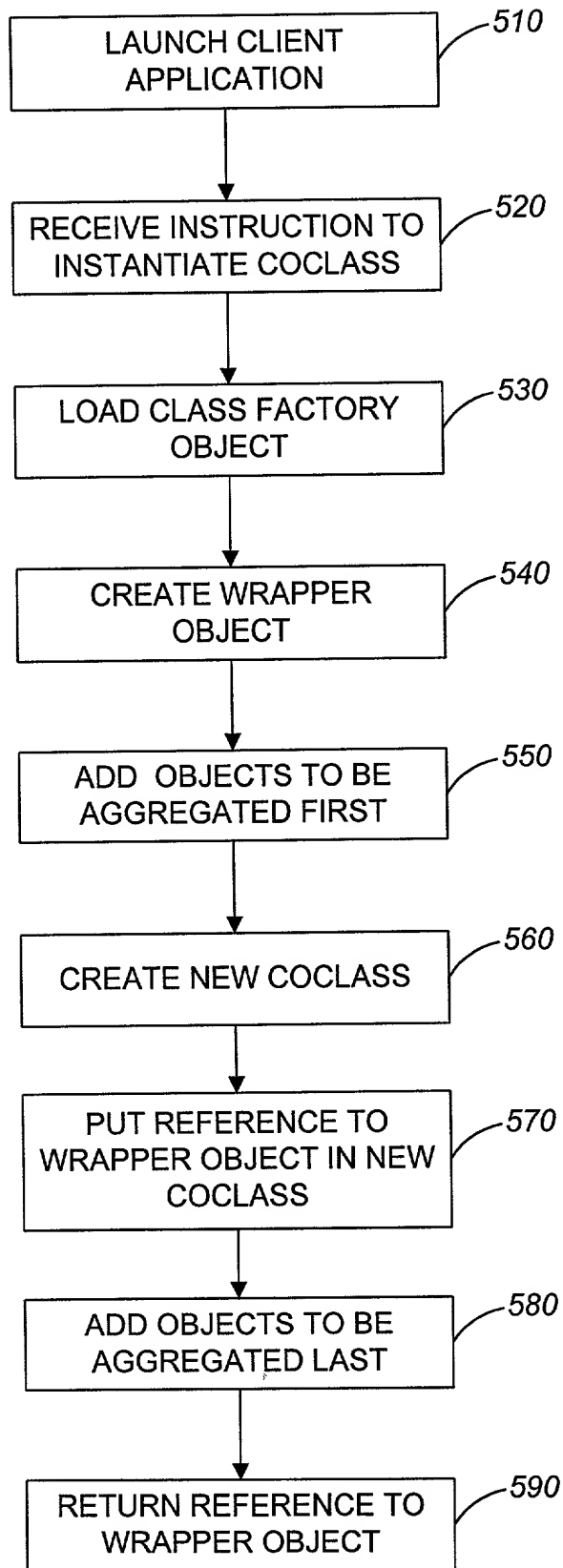
FIGURE 16-4E



When the user selects deleting a project from the VBA IDE, the VBProjectEvents.ProjItemRemoved handler in the AddIn removes the project's custom settings in the data structures in the AddIn. Also when the user inserts/deletes a designer info/ from a project, or inserts/deletes a class info from a project, the VBCommandBarEvents:Click event handler in the AddIn and designer, respectively, add to or delete from the data caches in the AddIn and designer.

FIG. 4E





500

FIG. 5

# Client

DllGetClassObject caches the CoClass CLSID and returns the class factory for the Wrapper object.

VBA Object Instantiation  
VBACoClassWrapperObj::FinalConstruct

Client

CoCreateInstance (CoClassCLSID)

VBACoClassWrapperObj(FinalConstruct)

CoClassCLSID

Registry

DesClassFactoryProgID

CoClassCLSID

Registry

AggsBeforeCLSIDs,  
AggsAfterCLSIDs

CreateAggsBefore and AddToAggObjectVector

CoCreateInstance()

IDispatch QueryInterface(ISymyxVbaClassFactory)

ISymyxVbaClassFactory

AddToAggObjectVector (VBACoClass)

AddCoClassesToAggObjectVector and  
CreateAggsAfter and AddToAggObjectVector

VBACoClassWrapperObj

Custom Designer Run Time

Project DLL

VBA Designer Object  
Treat as a Class Factory  
(One per project)

Select Case(CoClassProgID)

CoCreateInstance()

ISymyxVbaClassFactory::CreateInstance  
(CoClassProgID)

IDispatch

IDispatch::pvt\_TheContextObject(GetControllingUnknown)

Public Creatable VBA  
class

FIG. 6

# ATL Wrapper Object

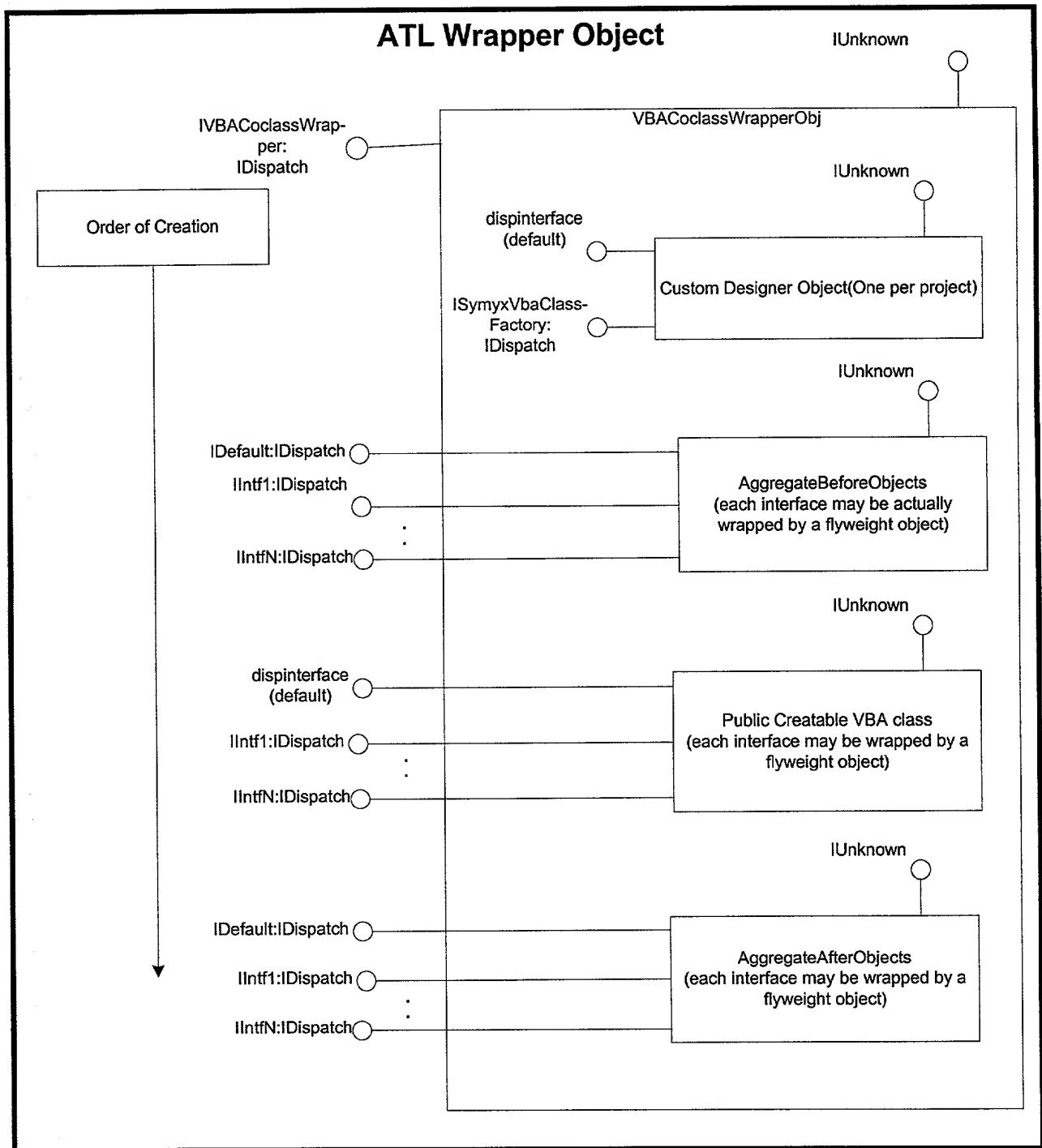


FIG. 7

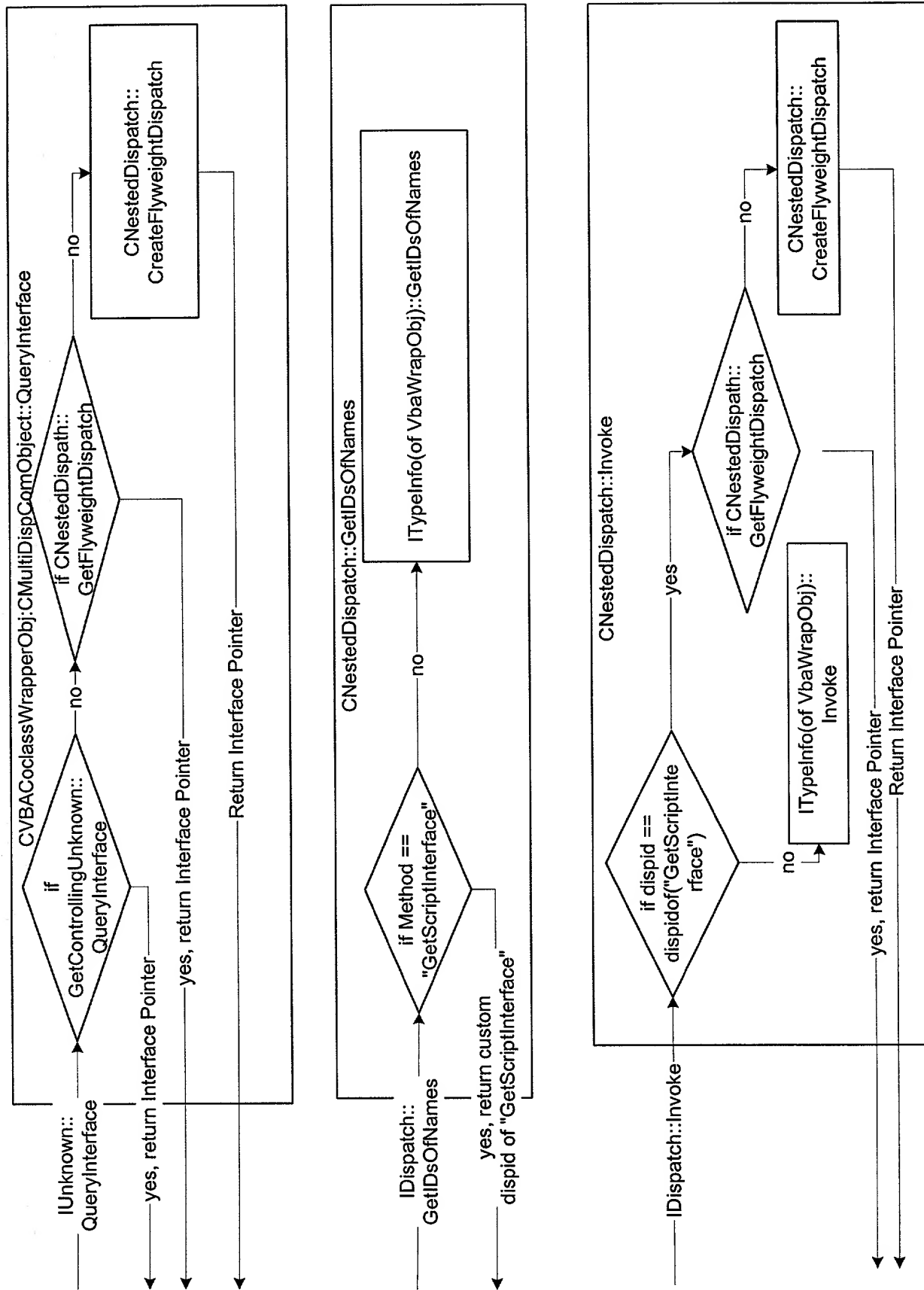


FIG. 8

FIG. 9

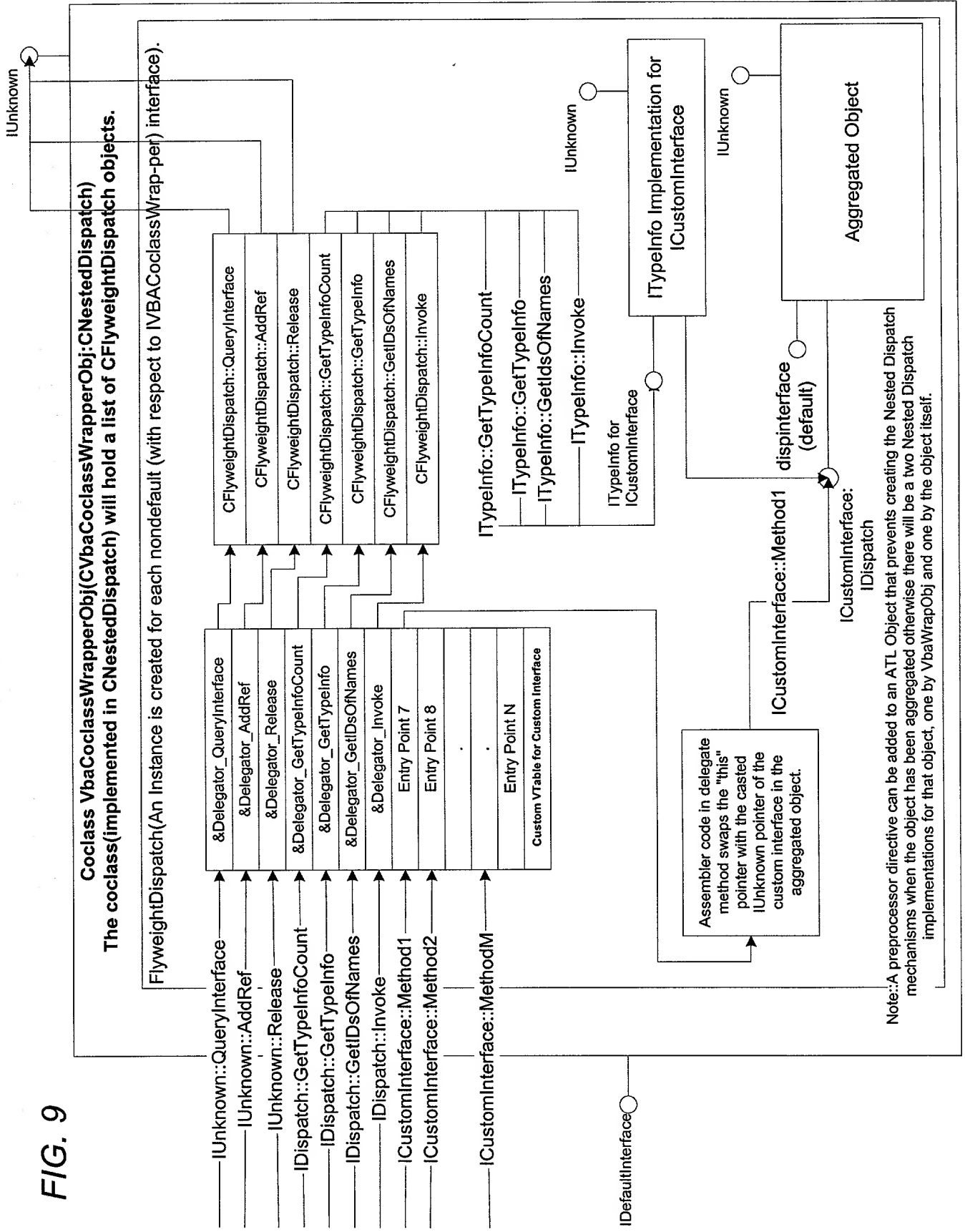
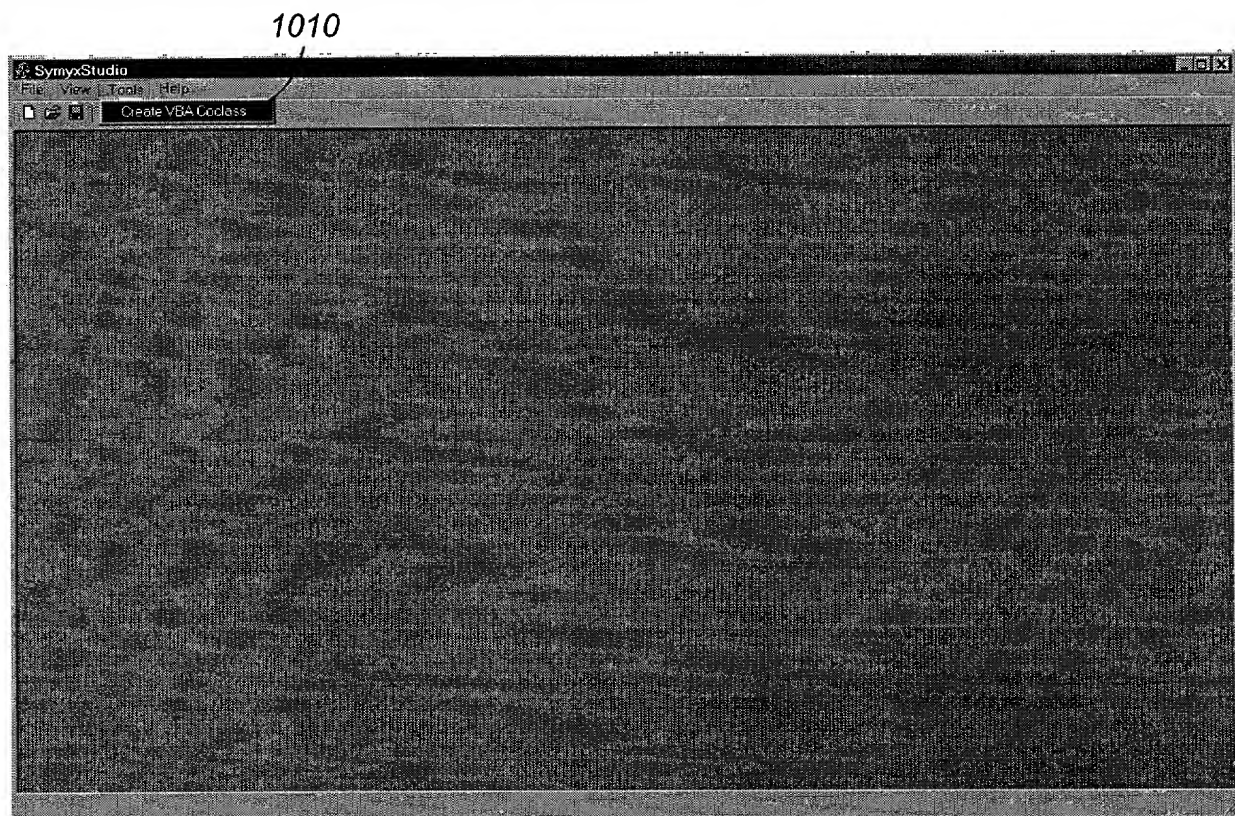
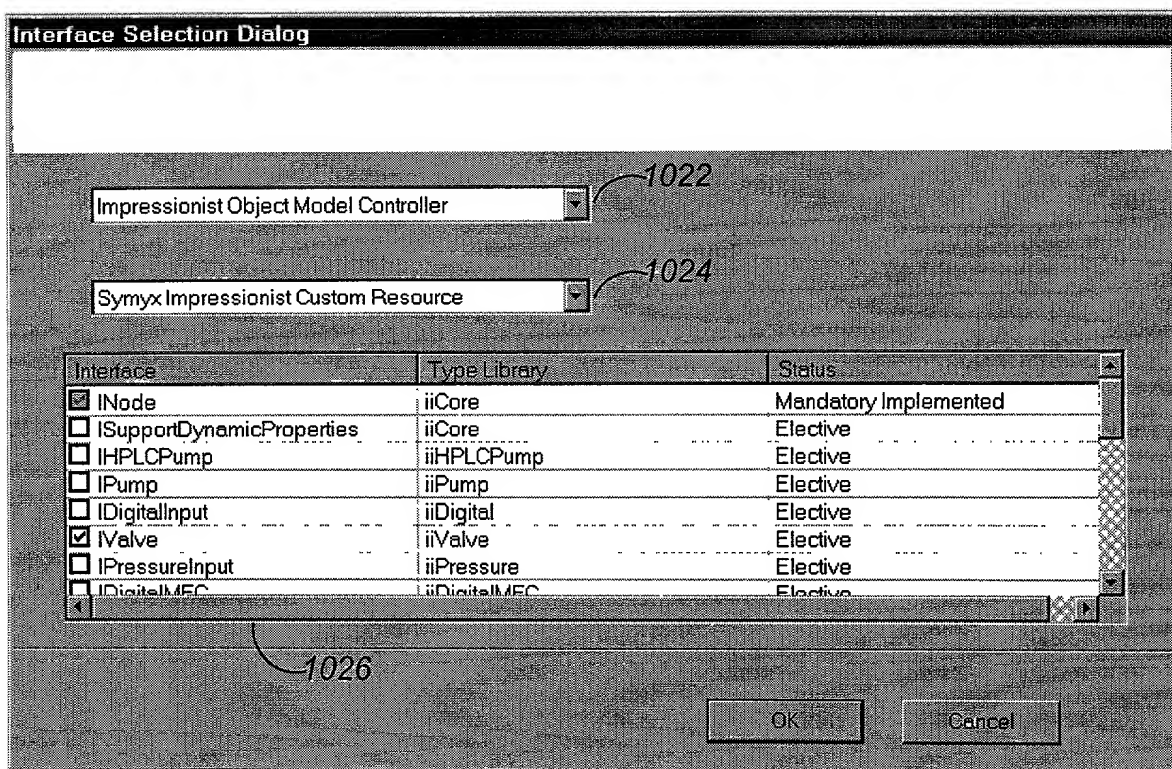


FIG. 10A



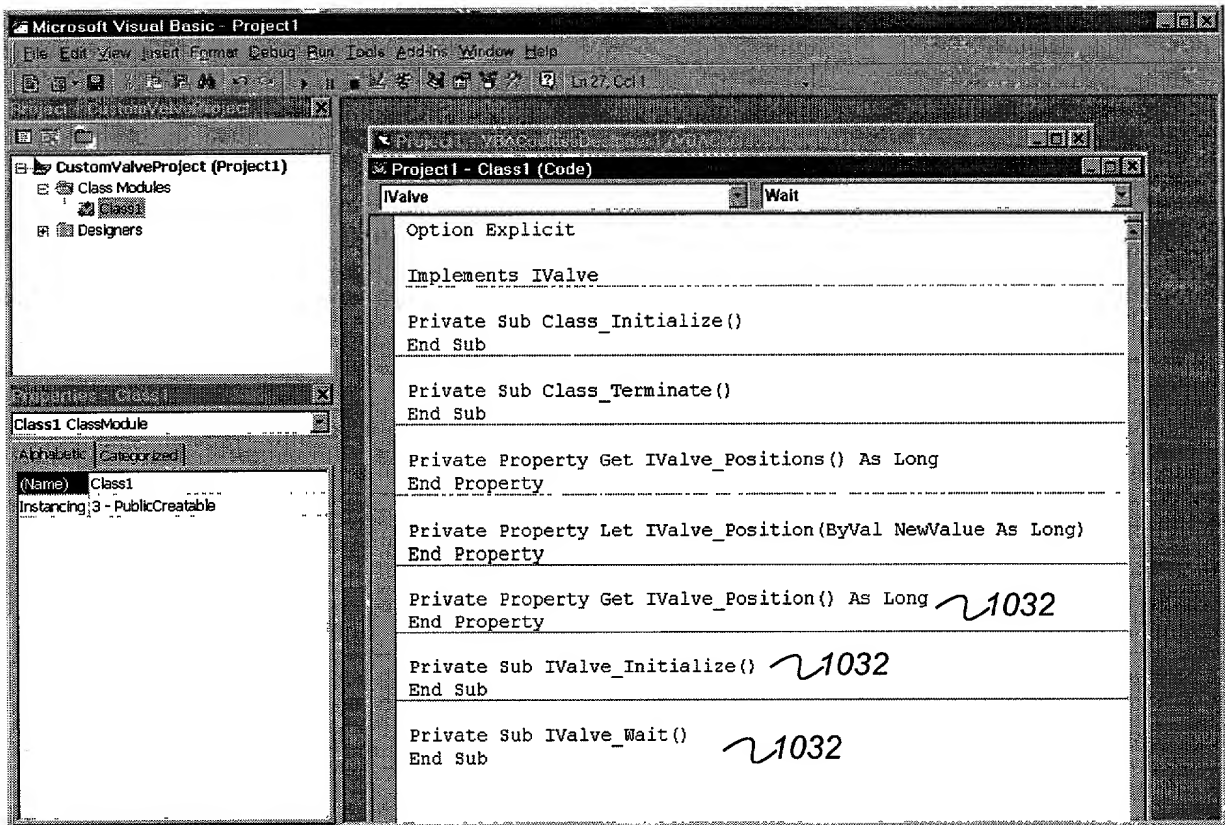
1000

FIG. 10A



1020

FIG. 10B



1030

FIG. 10C

Microsoft Visual Basic - F:\VBAIntegrationDemo\CustomValveProject.vba

File Edit View Insert Format Debug Run Tools Add-Ins Window Help

CustomValveProject (F:\VBAIntegrationDemo\CustomValveProject) - Class1 (Code)

Class Initialize

```

Implements IValve

Private m_ValvePosition As Long
Private m_Address As IPropertyInteger
Private m_NumPositions As IPropertySingleChoice

Private Sub Class_Initialize()

    Dim AggNode As INode
    Set AggNode = TheContextObject
    AggNode.Version = 1
    AggNode.IconResID = 0
    AggNode.Name = "Dave's Custom Valve"

    Set m_Address = New PropertyInteger
    m_Address.Name = "Address"
    m_Address.XMLTag = "Address"
    m_Address.Value = 1
    AggNode.Properties.Add m_Address

    Set m_NumPositions = New PropertyEnum
    m_NumPositions.Name = "Number of Positions"
    m_NumPositions.XMLTag = "NumPositions"
    m_NumPositions.Choices = "2|4|8|16"
    m_NumPositions.Text = "2"
    AggNode.Properties.Add m_NumPositions

    m_ValvePosition = 1

End Sub

Private Property Get IValve_Positions() As Long
    IValve_Positions = CLng(m_NumPositions.Text)
End Property

Private Property Let IValve_Position(ByVal newValue As Long)
    m_ValvePosition = newValue
End Property

Private Property Get IValve_Position() As Long
    IValve_Position = m_ValvePosition

```

1040

**FIG. 10D**



The screenshot shows the Impressionist 3.1 software interface. The title bar reads "Impressionist 3.1". The menu bar includes "File", "Server", "Window", and "Help". The "Resources" window is open, displaying a list of resources. A context menu is visible over the "Resources" window, showing options like "Rename", "Delete", "Move Up", "Move Down", "Copy", "Paste", and "Help". The "Custom" menu item is selected, and a list of custom resources is displayed, including "Brooks 5856", "Cavio Device Controller", "Cavio RSP Robot", "GSIOC Port", "Hervard 44 Port", "Microdrop Autodrop Controller", "National Instruments AT-MIO-16-E", "National Instruments PCI-6023E", "National Instruments PCI-6024E", "National Instruments PCI-6033E", "National Instruments PCI-6703", "National Instruments PCI-DIO-96", "National Instruments PCI-Step", "Serial Port", "Setra Transducer", "Smyx FPR Module", "Smyx Solenoid Controller", "Unit DMFC Port", "VIC Port", "Watlow MLC/CLS Controller", and "Watlow Series 96 Controller". A "Custom Valve Project Class1" window is also open, showing a list of resources. A "1050" label is visible next to the "Custom Valve Project Class1" window, and a "1055" label is visible next to the "National Instruments PCI-6033E" resource.

FIG. 10F

